

Fessenden might not be a name you're familiar with, but after reading W9IWI's article you will be. He, as with the others in this series, helped to form modern electronics.

A Page Out Of History

Reginald Fessenden

Years Ahead of the World

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In 1899 Reginald Fessenden told a meeting of the American Institute of Electrical Engineers "I consider myself proof against the seduction... of wireless telegraphy." He had "lost too much time" on fruitless projects in other areas to be lured by the mysteries of wireless. Yet by 1902 he was an acknowledged leader in the field of wireless signaling.

Fessenden's accomplishments over his lifetime include a form of continuous-wave (CW) transmission, the first two-way transatlantic wireless service, the first long-distance (1600 miles) wireless transmissions over land; an electrolytic detector, the wireless telephone, a heterodyne receiver, and a number of submarine signalling devices. These represented only some of his work. In all, he was awarded more than 500 patents.

Reginald Aubrey Fessenden was born in 1866 in East Bolton, Quebec. When he was nine years old the family moved to Niagara Falls, New York to take advantage of a scholarship offered him at DeVaux Military College. His further education continued in Canada.

At the age of 20 he became principal (and the entire teaching staff) of the Whitney Institute in Bermuda. They started early in those days! Recognizing that the institute offered only a dead-end job, he returned after two years to the U.S. for greater challenges.

Fessenden's interest in mathematics led him into electricity, and he sought work with Thomas A. Edison. After a time as an assistant tester on telephone lines which Edison was installing in New York City, he was given the choice of a job at the Edison



Commemorative stamp issued by Canada in 1984, honoring Reginald Fessenden as one of the world's foremost inventors.

Machine Works in Schenectady or at Edison's Llewellyn Park Laboratory. Fessenden chose to work directly under Edison, who encouraged him to specialize in chemistry, since so many electrical problems were linked to chemical reactions. Less than two years later he was Chief Chemist at the Lab. He stayed there until 1889 and then left for private consulting work. In 1892 he joined the faculty of Purdue University and later of the Western University of Pennsylvania. Fessenden was later always known to his associates as "the Professor."

Both teaching positions involved lecturing on electrical engineering, Hertzian waves, and experimental wireless. His studies convinced him that previous de-

velopments in wireless had been unscientific and had taken the wrong direction. To prove his theories he left the classroom and the laboratory for the inventor's workshop.

Fessenden soon became recognized as a major figure in the science of communications. The U.S. Department of Agriculture approached him to develop a system for transmitting Weather Bureau forecasts. He set up an experimental station at Cobb Island, Maryland. Two 50 foot wooden towers a mile apart, with other equipment, were used for quantitative measurements of transmissions. A "long distance" test was made with a receiving station in Arlington, Virginia, 50 miles away. A crude form of speech transmission between the two towers was also tried; it worked, although "it was accompanied by an extremely loud and disagreeable noise" from the spark transmitter according to his wife, Helen Fessenden.

Operations were so successful that the Weather Bureau enlarged the program with stations at Roanoke Island, Hatteras, and Cape Henry, all in Virginia. Experiments in wireless telephony and in an early form of continuous-wave (CW) transmission continued at Roanoke.

One shortcoming in the reception of wireless signals was the very inefficient coherer. It limited the range of Fessenden's "long distance" transmission on Cobb Island and was useless for wireless telephony. In fact, a race was on to find an improved detector. Marconi, who had used the coherer in his historic transatlantic test, developed "Maggie"—a magnetic detector. Lee De Forest was experimenting with an electric arc in a gas flame. Later, Greenleaf Whittier Pickard found that some minerals could act as rectifiers, and this led to the development of the crystal detector.